Volunteer Lake Assessment Program Individual Lake Reports

SUNSET LAKE, ALTON, NH

MORPHOMETRIC DATA

Watershed Area (Ac.):	3,598	**Max. Depth (m):**	23.7	**Flushing Rate (yr^{-1})**	1.7
Surface Area (Ac.):	205	**Mean Depth (m):**	5.6	**P Retention Coef:**	0.55
Shore Length (m):	5,600	**Volume (m^3):**	4,651,000	**Elevation (ft):**	808

TROPHIC CLASSIFICATION

Year	Trophic class
2000	OLIGOTROPHIC
2008	OLIGOTROPHIC

KNOWN EXOTIC SPECIES

The Waterbody Report Card tables are generated from the DRAFT 2014 305(b) report on the status of N.H. waters, and are based on data collected from 2004-2013. Detailed waterbody assessment and report card information can be found at www.des.nh.gov/organizations/divisions/water/wmb/swqa/index.htm

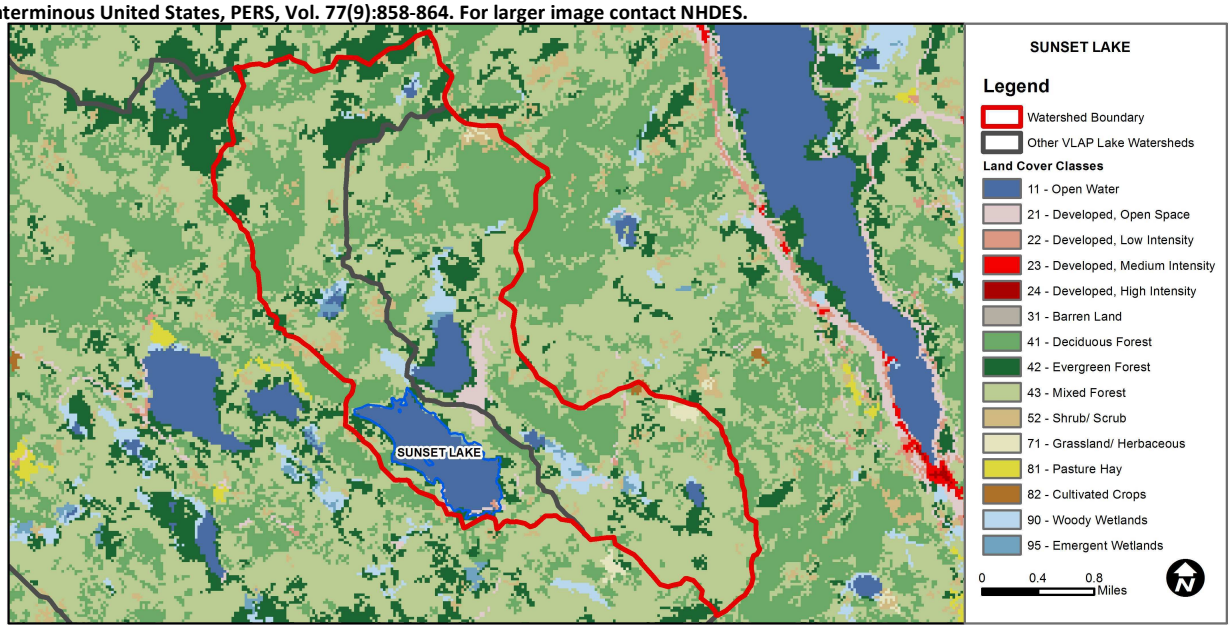
Designated Use	Parameter	Category	Comments
Aquatic Life	Phosphorus (Total)	Slightly Bad	The calculated median is from 5 or more samples and is > indicator and the chlorophyll a indicator is exceeded.
	pH	Slightly Bad	>10% of samples exceed criteria by a small margin (minimum of 2 exceedances).
	Oxygen, Dissolved	Encouraging	There are < 10 samples with 0 exceedances of criteria. More data needed.
	Dissolved oxygen satura	Cautionary	There are < 10 samples with 1 exceedance of criteria. More data needed.
	Chlorophyll-a	Slightly Bad	The calculated median is from 5 or more samples and is > indicator.
Primary Contact Recreation	Escherichia coli	Very Good	Where there are no geometric means, all bacteria samples are < 75% of the geometric mean. Where there are geometric means all single bacteria samples are < the SSMC and all geometric means are < geometric mean criteria.
	Chlorophyll-a	Very Good	There are a total of at least 10 samples with 0 exceedances of indicator.

BEACH PRIMARY CONTACT ASSESSMENT STATUS

SUNSET LAKE HIDDEN VALLEY BEACH	Escherichia coli	Very Good	Where there are no geometric means, all bacteria samples are < 75% of the geometric mean. Where there are geometric means all single bacteria samples are < the SSMC and all geometric means are < geometric mean criteria.

WATERSHED LAND USE SUMMARY

Fry, J., Xian, G., Jin, S., Dewitz, J., Homer, C., Yang, L., Barnes, C., Herold, N., and Wickham, J., 2011. Completion of the 2006 National Land Cover Database for the Conterminous United States, PERS, Vol. 77(9):858-864. For larger image contact NHDES.



Land Cover Category	% Cover	Land Cover Category	% Cover	Land Cover Category	% Cover
Open Water	7.75	Barren Land	0	Grassland/Herbaceous	0.44
Developed-Open Space	1.65	Deciduous Forest	29.3	Pasture Hay	0
Developed-Low Intensity	0.09	Evergreen Forest	10.93	Cultivated Crops	0.07
Developed-Medium Intensity	0	Mixed Forest	44.02	Woody Wetlands	2.57
Developed-High Intensity	0	Shrub-Scrub	2.48	Emergent Wetlands	0.72

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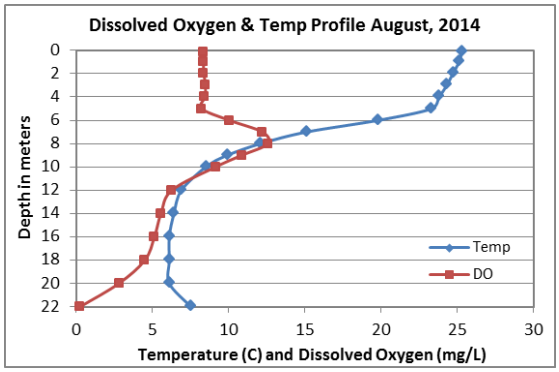
2014 Data Summary

Observations and Recommendations (*Refer to Table 1 and Historical Deep Spot Data Graphics)*

- **Chlorophyll-a:** Chlorophyll levels decreased slightly from July to August and were much less than the state median. Historical trend analysis indicates relatively stable chlorophyll levels since monitoring began.
- **Conductivity/Chloride:** Deep spot and tributary conductivity levels were low in July and August and much less than the state median. Historical trend analysis indicates stable epilimnetic (upper water layer) conductivity levels since monitoring began.
- **E. coli:** Outlet E. coli levels were very low in July and much less than the state standards for public beaches and surface waters.
- **Total Phosphorus:** Epilimnetic and metalimnetic (middle water layer) phosphorus levels were low and much less than the state median. Historical trend analysis indicates highly variable epilimnetic phosphorus levels between years. Hypolimnetic (lower water layer) phosphorus was elevated in July and the turbidity was also elevated indicating potential bottom sediment contamination in the sample. Hypolimnetic phosphorus levels improved greatly in August and were very low. Inlet and Outlet phosphorus levels were low in July and August.
- **Transparency:** Transparency was good in 2014, improved from July to August, and was better than the state median. Transparency measured with the viewscope (VS) was much better than that measured without and likely a better representation of water clarity. However, historical trend analysis indicates significantly decreasing (worsening) transparency since monitoring began.
- **Turbidity:** Epilimnetic turbidity was low, metalimnetic turbidity was slightly higher in July indicating algal growth at that depth, and hypolimnetic turbidity was elevated in July potentially due to bottom sediment in the sample. Inlet and Outlet turbidities were low.
- **pH:** Epilimnetic and metalimnetic pH levels were within the desirable range 6.5—8.0 units, however have historically fluctuated below desirable. Historical trend analysis indicates significantly decreasing (worsening) epilimnetic pH since monitoring began. Hypolimnetic pH levels were less than 6.5 units in July and August.
- **Dissolved Oxygen/Temp:** Dissolved oxygen levels were good from the surface through 18 meters, and then decreased gradually from 18 meters to the lake bottom. Dissolved oxygen levels spiked between six and eight meters indicating a layer of algae at those depths.
- **Recommended Actions:** Deep spot total phosphorus and chlorophyll levels have become slightly more variable in recent years, and transparency has significantly decreased. This may be a result of the increased frequency and intensity of significant storm events during the summer. Significant storm events and resulting stormwater runoff can transport nutrients, sediments and other pollutants into nearby waterbodies. Encourage lake and watershed residents to utilize only phosphate free fertilizers when necessary, maintain vegetated buffers along the shoreline, and identify areas of stormwater runoff on their properties. The "NH Homeowner's Guide to Stormwater Runoff" can be utilized to install stormwater devices to divert, capture and infiltrate stormwater before it reaches the lake. Keep up the great work!



NH Water Quality Standards: Numeric criteria for specific parameters. Results exceeding criteria are considered a water quality violation.

Chloride: > 230 mg/L (chronic)

E. coli: > 88 cts/100 mL – public beach

E. coli: > 406 cts/100 mL – surface waters

Turbidity: > 10 NTU above natural level

pH: between 6.5-8.0 (unless naturally occurring)

Station Name	Table 1. 2014 Average Water Quality Data for SUNSET LAKE								
	Alk. mg/l	Chlor-a ug/l	Cond. uS/cm	E. Coli #/100ml	Total P ug/l	Trans. m		Turb. ntu	pH
						NVS	VS		
Epilimnion	4.45	2.81	27.0		4	5.58	7.25	0.69	6.79
Metalimnion			25.5		7			0.98	6.64
Hypolimnion			26.6		13			2.51	6.09
Inlet			24.9		6			0.55	6.44
Outlet			27.2	10	3			0.52	6.77

NH Median Values: Median values for specific parameters generated from historic lake monitoring data.

Alkalinity: 4.9 mg/L

Chlorophyll-a: 4.58 mg/m^3

Conductivity: 40.0 uS/cm

Chloride: 4 mg/L

Total Phosphorus: 12 ug/L

Transparency: 3.2 m

pH: 6.6

Historical Water Quality Trend Analysis

Parameter	Trend	Explanation	Parameter	Trend	Explanation
Conductivity	Stable	Trend not significant; data show low variability.	Chlorophyll-a	Stable	Trend not significant; data moderately variable.
pH (epilimnion)	Worsening	Data significantly decreasing.	Transparency	Worseing	Data significantly decreasing.
			Phosphorus (epilimnion)	Stable	Trend not significant; data highly variable.